



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

September 19, 2022

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Medical Officer

A. ACCIDENT INFORMATION

Identification: WPR20LA319

Location: Santa Barbara, California

Date: September 27, 2020

B. GROUP IDENTIFICATION

No group was formed for the medical evaluation in this accident.

C. DETAILS OF INVESTIGATION

1. Purpose

This investigation was performed to evaluate the pilot for medical conditions, the use of medications/illicit drugs, and the presence of toxins.

2. Methods

The Federal Aviation Administration (FAA) medical case review and the pilot's autopsy/coroner and toxicology reports were reviewed. Selected investigator reports and relevant regulation and medical literature were also reviewed.

3. Findings

a. Medical Case Review

According to the FAA medical case review, the 61-year-old female pilot's last aviation medical examination was on November 30, 2018. At that time, she reported 1150 total civilian flight hours. She was 56 inches tall and weighed 122 pounds. She reported using estradiol, a prescription hormone medication that can be used to treat symptoms of menopause and which generally is not considered impairing. She reported no active medical conditions. No significant issues were identified, and she was issued a third-class medical certificate limited by a requirement to have available glasses for near vision.

b. Autopsy

The Santa Barbara County Sheriff-Coroner Coroner's Bureau performed the pilot's autopsy. According to the coroner report, the cause of death was multiple traumatic injuries and the manner of death was accidental. According to the autopsy report, because of the pilot's injuries, her brain was not available for examination, and examination of her heart was somewhat limited. Within these limitations, the autopsy found no evidence of significant natural disease.

c. Toxicology

At the request of the Sheriff-Coroner, Ascertain Forensics performed postmortem toxicological testing of spleen tissue from the pilot.¹ This testing detected ethanol at 0.05 g/dL, and presumptively identified (without confirmation) β -phenylethylamine.

The FAA Forensic Sciences Laboratory also performed postmortem toxicological testing of specimens from the pilot.² FAA testing detected ethanol at 0.024 g/dL in cavity blood, and did not detect ethanol in urine.³

d. Descriptions of Detected Substances

Ethanol is a type of alcohol. It is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance.⁴ FAA regulation imposes strict limits on flying after consuming ethanol, including prohibiting pilots from flying with a blood ethanol level of 0.04 g/dL or greater.⁵ However, consumption is not the only possible source of ethanol in postmortem specimens. Ethanol can be produced by microbes in a person's body after death.^{6,7} β -phenylethylamine is another substance that can be produced by microbes in a person's body after death.⁸

¹ According to the Ascertain Forensics toxicology report, tested-for substances included volatiles (ethanol, isopropanol, methanol, and acetone) and acidic, neutral, and basic drugs.

² The FAA Forensic Sciences Laboratory tests for a wide variety of substances including toxins, prescription and over-the-counter medications, and illicit drugs. Many of these substances are listed at <https://jag.cami.jcabi.gov/toxicology>.

³ According to the [FAA Forensic Sciences Laboratory website](#), the fact that ethanol was not detected in urine indicates that the ethanol level in urine was less than 0.001 g/dL.

⁴ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

⁵ [14 Code of Federal Regulations § 91.17](#).

⁶ Spitz WU. Forensic aspects of alcohol. In: Spitz WU, Spitz DJ, eds. *Spitz and Fisher's Medicolegal Investigation of Death: Guidelines for the Application of Pathology to Crime Investigation*. 4th ed. Springfield, IL: Charles C Thomas; 2006:1218-1229.

⁷ Kugelberg FC, Jones AW. Interpreting results of ethanol analysis in postmortem specimens: a review of the literature. *Forensic Sci Int*. 2007;165(1):10-29. doi: 10.1016/j.forsciint.2006.05.004.

⁸ Federal Aviation Administration Civil Aerospace Medical Institute. Phenylethylamine. Forensic Toxicology's WebDrugs. <https://jag.cami.jcabi.gov/toxicology/DrugDetail.asp?did=102>. Updated January 16, 2019. Accessed September 16, 2022.

D. SUMMARY OF MEDICAL FINDINGS

The 61-year-old female pilot's last aviation medical examination was on November 30, 2018. At that time, she reported using estradiol, a prescription hormone medication that can be used to treat symptoms of menopause and which generally is not considered impairing. She was issued a third-class medical certificate limited by a requirement to have available glasses for near vision.

The Santa Barbara County Sheriff-Coroner Coroner's Bureau performed the pilot's autopsy. According to the coroner report, the cause of death was multiple traumatic injuries and the manner of death was accidental. According to the autopsy report, because of the pilot's injuries, her brain was not available for examination, and examination of her heart was somewhat limited. Within these limitations, the autopsy found no evidence of significant natural disease.

The pilot's postmortem toxicological testing detected ethanol at 0.024 g/dL in cavity blood and 0.05 g/dL in spleen tissue. Ethanol was not detected (less than 0.001 g/dL) in urine. β -phenylethylamine was presumptively identified in spleen tissue.